High Performance HD LED Monitor

UML-463-90

BOSCH

en User Manual

Table of contents

1 Safety

1.1 Important safety instructions

Read, follow, and retain for future reference all of the following safety instructions. Heed all warnings on the unit and in the operating instructions before operating the unit.

1. **Cleaning -** Unplug the unit from the outlet before cleaning. Follow any instructions provided with the unit. Generally, using a dry cloth for cleaning is sufficient, but a moist fluff-free cloth or leather shammy may also be used. Do not use liquid cleaners or aerosol cleaners.
2. **Heat Sources -** Do not install the unit near any heat sources such as radiators, heaters, stoves, or other equipment (including amplifiers) that produce heat.
3. **Ventilation -** Any openings in the unit enclosure are provided for ventilation to prevent overheating and ensure reliable operation. Do not block or cover these openings. Do not place the unit in an enclosure unless proper ventilation is provided, or the manufacturer's instructions have been adhered to.
4. **Water -** Do not use this unit near water, for example near a bathtub, washbowl, sink, laundry basket, in a damp or wet basement, near a swimming pool, in an outdoor installation, or in any area classified as a wet location. To reduce the risk of fire or electrical shock, do not expose this unit to rain or moisture.
5. **Object and liquid entry -** Never push objects of any kind into this unit through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electrical shock. Never spill liquid of any kind on the unit. Do not place objects filled with liquids, such as vases or cups, on the unit.
6. **Lightning -** For added protection during a lightning storm, or when leaving this unit unattended and unused for long periods, unplug the unit from the wall outlet and disconnect the cable system. This will prevent damage to the unit from lightning and power line surges.
7. **Controls adjustment -** Adjust only those controls specified in the operating instructions. Improper adjustment of other controls may cause damage to the unit. Use of controls or adjustments, or performance of procedures other than those specified, may result in hazardous radiation exposure.
8. **Overloading -** Do not overload outlets and extension cords. This can cause fire or electrical shock.
9. **Power cord and plug protection -** Protect the plug and power cord from foot traffic, being pinched by items placed upon or against them at electrical outlets, and its exit from the unit.
10. **Power disconnect -** Units have power supplied to the unit whenever the power cord is inserted into the power source. The power cord is the main power disconnect device for switching off the voltage for all units.
11. **Power sources -** Operate the unit only from the type of power source indicated on the label. Before proceeding, be sure to disconnect the power from the cable to be installed into the unit.
    - For battery powered units, refer to the operating instructions.
    - For external power supplied units, use only the recommended or approved power supplies.
    - For limited power source units, this power source must comply with *EN60950*. Substitutions may damage the unit or cause fire or shock.

- If unsure of the type of power supply to use, contact your dealer or local power company.

12. **Servicing -** Do not attempt to service this unit yourself. Opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
13. **Damage requiring service -** Unplug the unit from the main AC power source and refer servicing to qualified service personnel when any damage to the equipment has occurred, such as:
    - the power supply cord or plug is damaged;
    - exposure to moisture, water, and/or inclement weather (rain, snow, etc.);
    - liquid has been spilled in or on the equipment;
    - an object has fallen into the unit;
    - unit has been dropped or the unit cabinet is damaged;
    - unit exhibits a distinct change in performance;
    - unit does not operate normally when the user correctly follows the operating instructions.
14. **Replacement parts -** Be sure the service technician uses replacement parts specified by the manufacturer, or that have the same characteristics as the original parts. Unauthorized substitutions may cause fire, electrical shock, or other hazards.
15. **Safety check -** Safety checks should be performed upon completion of service or repairs to the unit to ensure proper operating condition.
16. **Installation -** Install in accordance with the manufacturer's instructions and in accordance with applicable local codes.
17. **Attachments, changes or modifications -** Only use attachments/accessories specified by the manufacturer. Any change or modification of the equipment, not expressly approved by Bosch, could void the warranty or, in the case of an authorization agreement, authority to operate the equipment.

1.2 Safety precautions

Danger!

High risk: This symbol indicates an imminently hazardous situation such as “Dangerous Voltage” inside the product.

If not avoided, this will result in an electrical shock, serious bodily injury, or death.

Warning!

Medium risk: Indicates a potentially hazardous situation.

If not avoided, this could result in minor or moderate bodily injury.

Caution!

Low risk: Indicates a potentially hazardous situation.

If not avoided, this could result in property damage or risk of damage to the unit.

1.3 Important notices

Copyright

This manual is the intellectual property of Bosch Security Systems and is protected by copyright.

Disclaimer

Underwriter Laboratories Inc. (“UL”) has not tested the performance or reliability of the security or signaling aspects of this product. UL has only tested fire, shock and/or casualty hazards as outlined in UL's *Standard(s) for Safety for Closed Circuit Television Equipment, UL 2044*. UL Certification does not cover the performance or reliability of the security or signaling aspects of this product.

UL MAKES NO REPRESENTATIONS, WARRANTIES, OR CERTIFICATIONS WHATSOEVER REGARDING THE PERFORMANCE OR RELIABILITY OF ANY SECURITY OR SIGNALING RELATED FUNCTIONS OF THIS PRODUCT.

Disclaimer

Underwriter Laboratories Inc. (“UL”) has not tested the performance or reliability of the security or signaling aspects of this product. UL has only tested fire, shock and/or casualty hazards as outlined in UL's *Standard(s) for Safety for Information Technology Equipment, UL 60950-1*. UL Certification does not cover the performance or reliability of the security or signaling aspects of this product.

UL MAKES NO REPRESENTATIONS, WARRANTIES, OR CERTIFICATIONS WHATSOEVER REGARDING THE PERFORMANCE OR RELIABILITY OF ANY SECURITY OR SIGNALING-RELATED FUNCTIONS OF THIS PRODUCT.

FCC & ICES Information

(U.S.A. and Canadian Models Only)

This device complies with *part 15* of the *FCC Rules*. Operation is subject to the following conditions:

– this device may not cause harmful interference, and
– this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a **Class A** digital device, pursuant to *Part 15* of the *FCC Rules* and *ICES-003* of *Industry Canada*. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a **commercial environment**. This equipment generates, uses, and radiates radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his expense.

Intentional or unintentional modifications, not expressly approved by the party responsible for compliance, shall not be made. Any such modifications could void the user's authority to operate the equipment. If necessary, the user should consult the dealer or an experienced radio/television technician for corrective action.

The user may find the following booklet, prepared by the Federal Communications Commission, helpful: *How to Identify and Resolve Radio-TV Interference Problems*. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

Accessories - Do not place this unit on an unstable stand, tripod, bracket, or mount. The unit may fall, causing serious injury and/or serious damage to the unit. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer. When a cart is used, use caution and care when moving the cart/apparatus combination to avoid injury from tip-over. Quick stops, excessive force, or uneven surfaces may cause the cart/unit combination to overturn. Mount the unit per the manufacturer's instructions.

All-pole power switch - Incorporate an all-pole power switch, with a contact separation of at least 3 mm in each pole, into the electrical installation of the building.If it is needed to open the housing for servicing and/or other activities, use this all-pole switch as the main disconnect device for switching off the voltage to the unit.

Coax grounding:

- Ground the cable system if connecting an outside cable system to the unit.
- Connect outdoor equipment to the unit's inputs only after this unit has had its grounding plug connected to a grounded outlet or its ground terminal is properly connected to a ground source.
- Disconnect the unit's input connectors from outdoor equipment before disconnecting the grounding plug or grounding terminal.
- Follow proper safety precautions such as grounding for any outdoor device connected to this unit.

U.S.A. models only - *Section 810* of the *National Electrical Code, ANSI/NFPA No.70*, provides information regarding proper grounding of the mount and supporting structure, grounding of the coax to a discharge unit, size of grounding conductors, location of discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

	**Disposal -** Your Bosch product was developed and manufactured with high-quality material and components that can be recycled and reused. This symbol means that electronic and electrical appliances, which have reached the end of their working life, must be collected and disposed of separately from household waste material. Separate collecting systems are usually in place for disused electronic and electrical products. Please dispose of these units at an environmentally compatible recycling facility, per *European Directive 2002/96/EC*

Electronic Surveillance - This device is intended for use in public areas only. U.S. federal law strictly prohibits surreptitious recording of oral communications.

Environmental statement - Bosch has a strong commitment towards the environment. This unit has been designed to respect the environment as much as possible.

Electrostatic-sensitive device - Use proper CMOS/MOS-FET handling precautions to avoid electrostatic discharge. NOTE: Wear required grounded wrist straps and observe proper ESD safety precautions when handling the electrostatic-sensitive printed circuit boards.

Fuse rating - For security protection of the device, the branch circuit protection must be secured with a maximum fuse rating of 16A. This must be in accordance with *NEC800 (CEC Section 60)*.

Grounding and polarization - This unit may be equipped with a polarized alternating current line plug (a plug with one blade wider than the other blade). This safety feature allows the plug to fit into the power outlet in only one way. If unable to insert the plug fully into the outlet, contact a locally certified electrician to replace the obsolete outlet. Do not defeat the safety purpose of the polarized plug.

Alternately, this unit may be equipped with a 3-pole grounding plug (a plug with a third pin for earth grounding). This safety feature allows the plug to fit into a grounded power outlet only. If unable to insert the plug into the outlet, contact a locally certified electrician to replace the obsolete outlet. Do not defeat the safety purpose of the grounding plug.

Moving - Disconnect the power before moving the unit. Move the unit with care. Excessive force or shock may damage the unit and the hard disk drives.

Outdoor signals - The installation for outdoor signals, especially regarding clearance from power and lightning conductors and transient protection, must be in accordance with *NEC725* and *NEC800 (CEC Rule 16-224* and *CEC Section 60)*.

Permanently connected equipment - Incorporate a readily accessible disconnect device in the building installation wiring.

Pluggable equipment - Install the socket outlet near the equipment so it is easily accessible.
Power resupply - If the unit is forced to power down due to exceeding the specified operating temperatures, disconnect the power cord, wait for at least 30 seconds, and then reconnect the power cord.
Power lines - Do not locate the display near overhead power lines, power circuits, or electrical lights, nor where it may contact such power lines, circuits, or lights.
Rack-mount

- Ventilation - Do not place this unit in a built-in installation or rack without proper ventilation or adhering to the manufacturer's instructions. The equipment must not exceed its maximum operating temperature requirements.
- Mechanical loading - Properly mount the equipment in a rack to prevent a hazardous condition due to uneven mechanical loading.

SELV
All the input/output ports are Safety Extra Low Voltage (SELV) circuits. SELV circuits should only be connected to other SELV circuits.
Because the ISDN circuits are treated like telephone-network voltage, avoid connecting the SELV circuit to the Telephone Network Voltage (TNV) circuits.
System ground/Safety ground
The system ground is only used to comply with safety standards or installation practices in certain countries. Bosch does **not** recommend connecting system ground to safety ground unless it is explicitly required. However, if the system ground and safety ground are connected and grounding loops are causing interference in the video signal, use an isolation transformer (available separately from Bosch).

Caution!
Connecting System ground to Safety ground may result in ground loops that can disrupt the CCTV system.

Video loss - Video loss is inherent to digital video recording; therefore, Bosch Security Systems cannot be held liable for any damage that results from missing video information. To minimize the risk of lost digital information, Bosch Security Systems recommends multiple, redundant recording systems, and a procedure to back up all analog and digital information.

Notice!
This is a class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

Informations FCC et ICES
(modèles utilisés aux États-Unis et au Canada uniquement)
Ce produit est conforme aux normes *FCC partie 15*. la mise en service est soumises aux deux conditions suivantes :

- cet appareil ne peut pas provoquer d'interférence nuisible et
- cet appareil doit pouvoir tolérer toutes les interférences auxquelles il est soumit, y compris les interférences qui pourraient influer sur son bon fonctionnement.

AVERTISSEMENT : Suite à différents tests, cet appareil s'est révélé conforme aux exigences imposées aux appareils numériques de **Classe A** en vertu de la *section 15 du règlement* de la *Commission fédérale des communications des États-Unis (FCC)*. Ces contraintes sont destinées à fournir une protection raisonnable contre les interférences nuisibles quand l'appareil est utilisé dans une **installation commerciale**. Cette appareil génère, utilise et émet de l'energie de fréquence radio, et peut, en cas d'installation ou d'utilisation non conforme aux

instructions, générer des interférences nuisibles aux communications radio. L'utilisation de ce produit dans une zone résidentielle peut provoquer des interférences nuisibles. Le cas échéant, l'utilisateur devra remédier à ces interférences à ses propres frais.
Au besoin, l'utilisateur consultera son revendeur ou un technicien qualifié en radio/télévision, qui procédera à une opération corrective. La brochure suivante, publiée par la Commission fédérale des communications (FCC), peut s'avérer utile : *How to Identify and Resolve Radio-TV Interference Problem*s (Comment identifier et résoudre les problèmes d'interférences de radio et de télévision). Cette brochure est disponible auprès du U.S. Government Printing Office, Washington, DC 20402, États-Unis, sous la référence n° 004-000-00345-4.

NOTE!
This manual has been compiled with great care and the information it contains has been thoroughly verified. The text was complete and correct at the time of printing. The ongoing development of the products may mean that the content of the user guide can change without notice. Bosch Security Systems accepts no liability for damage resulting directly or indirectly from faults, incompleteness or discrepancies between the user guide and the product described.

Trademarks
All hardware and software product names used in this document are likely to be registered trademarks and must be treated accordingly.

1.4 Customer support and services

If this unit needs service, contact the nearest Bosch Security Systems Service Center for authorization to return and shipping instructions.

Service Centers

USA

Repair Center-
Telephone: 800-566-2283
Fax: 800-366-1329
E-mail: repair@us.bosch.com

Customer Service
Telephone: 888-289-0096
Fax: 585-223-9180
E-mail: security.sales@us.bosch.com

Technical Support
Telephone: 800-326-1450
Fax: 585-223-3508 or 717-735-6560
E-mail: technical.support@us.bosch.com

Canada
Telephone: 514-738-2434
Fax: 514-738-8480

Europe, Middle East, Africa Region

Repair Center
Telephone: 31 (0) 76-5721500
Fax: 31 (0) 76-5721413
E-mail: RMADesk.STService@nl.bosch.com

Asia Region

Repair Center
Telephone: 65 63522776

Fax: 65 63521776
E-mail: rmahelpdesk@sg.bosch.com

Customer Service

Telephone: 86 (0) 756 7633117 or 86 (0) 756 7633121
Fax: 86 (0) 756 7631710
E-mail: customer.service@cn.bosch.com

Warranty and more information

For additional information and warranty queries, please contact your Bosch Security Systems representative or visit our website at www.boschsecurity.com.

2 Unpacking

This equipment should be unpacked and handled with care. If an item appears to have been damaged in shipment, notify the shipper immediately.
Verify that all the parts listed in the Parts List below are included. If any items are missing, notify your Bosch Security Systems Sales or Customer Service Representative.
The original packing carton is the safest container in which to transport the unit and must be used if returning the unit for service. Save it for possible future use.

2.1 Parts List

Quantity	Description
1	UML-463-90 Color LED Flat Panel Monitor
1	Installation manual (printed booklet, English version)
1	Installation manual (CD-ROM, multi-language version)
2	Power Cords, 3-wire with grounded plug 1.8 m (6 ft) long: – one with a U.S plug type – one with a European Continental plug type
1	DVI-D to DVI-D cable, 1.8 m (6 ft)
1	VGA to VGA (D-Sub) cable, 1.8 m (6 ft)
1	Remote control
2	AAA batteries

3 Access and connections

3.1 Monitor views

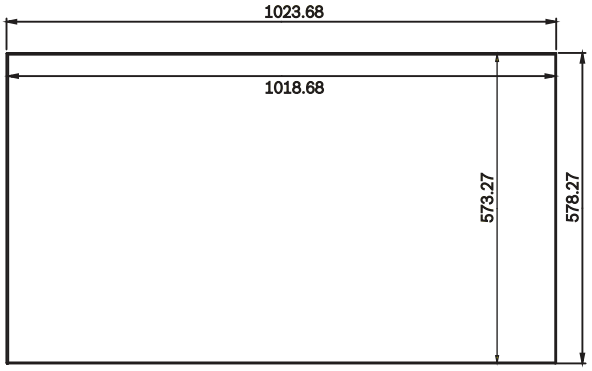


Figure 3.1: Front (with dimensions)

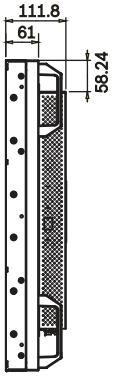


Figure 3.2: Side (with dimensions)

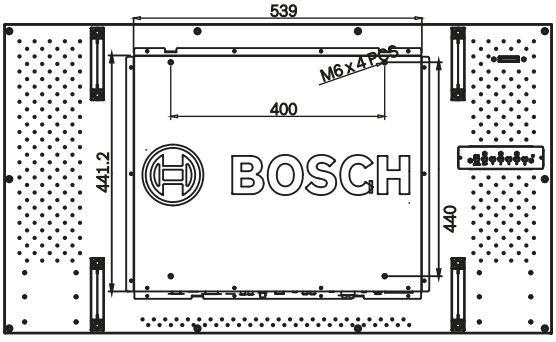


Figure 3.3: Back (with dimensions)

3.2 Rear panel exploded view

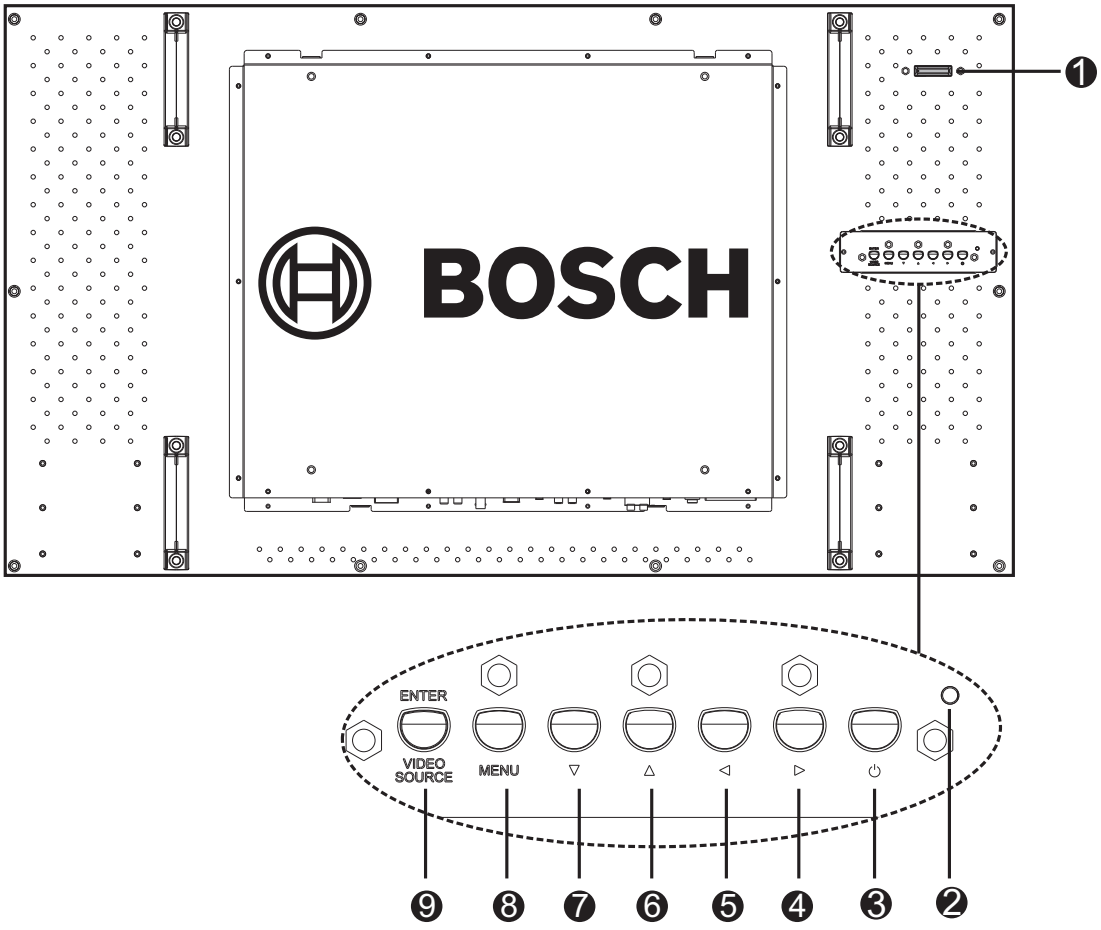


Figure 3.4: Rear panel exploded view

Ref.	Button	Description
1	IR sensor, ambient light sensor and LED Indicator	Receives the command signals from the remote control. Detects ambient lighting conditions around the display and adjusts screen brightness automatically when the Ambient Light Sensor function is activated. Indicates the operating status of the monitor: - Lights up green when power is turned on. - Lights up red when display is turned off. - Lights up red when display is in Power Save High mode. - Flashes red when display is in Power Save Low mode. - Off when power is turned off.
2	LED Indicator	Indicates the operating status of the monitor: - Lights up green when power is turned on. - Lights up red when display is turned off. - Lights up red when display is in Power Save High mode. - Flashes red when display is in Power Save Low mode. - Off when power is turned off.
3	Power	Turn monitor power On/Off

4	▶	Increases the value when in the OSD. Increases audio volume.	Scrolls right in the OSD.
5	◀	Decreases the value when in the OSD. Decreases audio volume.	Scrolls left in the OSD.
6	▲	Adjusts the value when in the OSD.	Scrolls up in the OSD.
7	▼	Adjusts the value when in the OSD. Activates the Auto Adjustment function when in PC mode.	Scrolls down in the OSD.
8	MENU	Selects the on-screen display (OSD).	
9	VIDEO SOURCE/ ENTER	Selects the signal to be displayed. Serves as the “Enter” function for OSD menus.	

3.3 Connectors

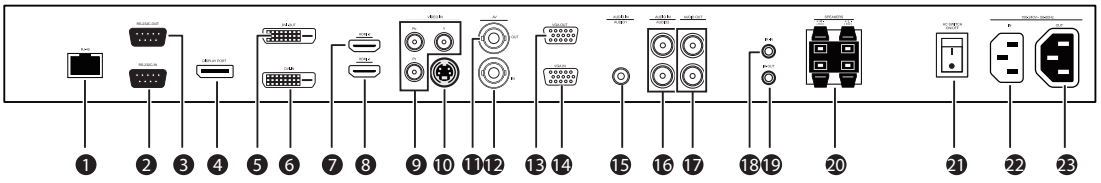
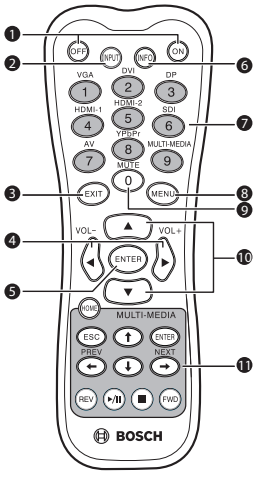


Figure 3.5: Connectors

Ref.	Connector	Ref.	Connector
1	RJ-45	13	VGA OUT
2	RS-232 IN (for firmware update)	14	VGA IN
3	RS-232 OUT (for firmware update	15	AUDIO IN - AUDIO 2
4	DISPLAY PORT IN	16	AUDIO IN - AUDIO 3
5	DVI-D OUT	17	AUDIO OUT (R/L)
6	DVI-D IN	18	IR IN
7	HDMI IN 2	19	IR OUT
8	HDMI IN 1	20	SPEAKERS (R/L)
9	VIDEO IN (COMPONENT)	21	AC SWITCH ON/OFF
10	VIDEO IN (S-VIDEO)	22	100 - 240 VAC IN
11	VIDEO OUT (Composite, BNC)	23	100 - 240 VAC OUT
12	VIDEO IN (Composite, BNC)		

3.4 Remote control



Ref.	Button	Description
1	POWER ON/OFF	Turns power on and off.
2	Input	Selects a signal source to display.
3	Exit	Exits the OSD menu.
4	Arrow Keys Vol + / Vol -	Moves the cursor down, up, left, and right in the OSD. Increases/decreases audio volume.
5	Enter.	Accepts a selection in an OSD menu.
6	Info	Displays the settings of the selected input.
7	Numeric buttons (1-9)/Input source	Function as numeric buttons when the OSD menu is active. Functions as input source buttons when the OSD menu is inactive. NOTE: SDI and MULTIMEDIA functions are not available with this display.
8	MENU	Displays the OSD Main menu. Press to return to the Main menu from anywhere in the OSD menus.
9	Numeric buttons (0)/MUTE	Performs as a numeric button when the OSD menu is active. Mutes the sound when the OSD menu is inactive.
10	Up/down keys	Moves the cursor up and down in the OSD.
11	Multi-media keys	No function.

3.5 Remote Control Battery Installation

1. Turn the remote over (buttons facing down) and push down on the cover and slide it off.
2. Insert two (2) new AAA alkaline batteries, matching the batteries to the (+) and (-) marks inside the battery case.
3. Slide the battery cover back into place.

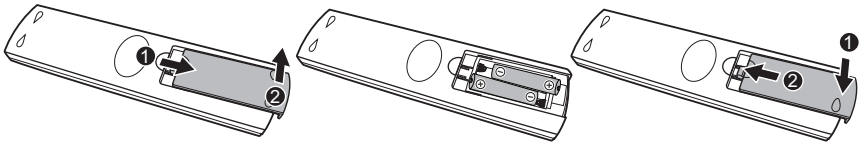


Figure 3.6: Remote Control Battery Replacement

Note: Replace batteries when required or at least once a year. Dispose of used batteries properly.

4 Description

The Bosch UML-463-90 High Performance LED monitor is a 1080p Full HD resolution color monitor ideal for use with digital video recorders (DVRs), and with PC applications. The monitor features a color LCD flat-screen panel with a 46-inch viewable picture area. The monitor features a wide range of horizontal and vertical viewing angles that provide comfortable, clear viewing – whether you mount it to a wall, ceiling or on a desktop.
You can access the monitor control functions from the push buttons and the on-screen display (OSD) menus. Refer to *Access and connections, page 12* for descriptions of the connectors and push buttons available on each model.

Feature overview

- Full HD 1920 x 1080 resolution
- Precise color reproduction
- HDMI, DVI, VGA, S-Video inputs
- Super-slim bezel for seamless tiled wall mounting
- High contrast ratio of 3500:1

Refer to *Technical data, page 37* for the complete description of all features and specifications.

5 Installing the Monitor

This chapter outlines the procedures to install the monitor. A qualified service person should install the monitor and adhere to all local codes.

5.1 Ventilation

To prevent overheating, ensure the ventilation openings on the rear of the monitor are **not** covered.

5.2 Installing accessories

The monitors are designed to be mounted to a wall using mounting accessories that are sold separately. The monitor can also be placed on a desktop using mounting desktop stands that are also sold separately. See the following chapters for the relevant installation descriptions. If necessary, refer to the Bosch Security Systems, Inc. Web site or contact your local customer support representative for more information.

5.2.1 Wall mount installation

The monitor can be wall-mounted using the mounting holes and a suitable wall mount or swivel/tilt mount. Use UL Listed mounting standards, and ensure the mounts are strong enough to bear the weight of the monitor. Refer to the following figure for the dimensions of the wall mounting holes.

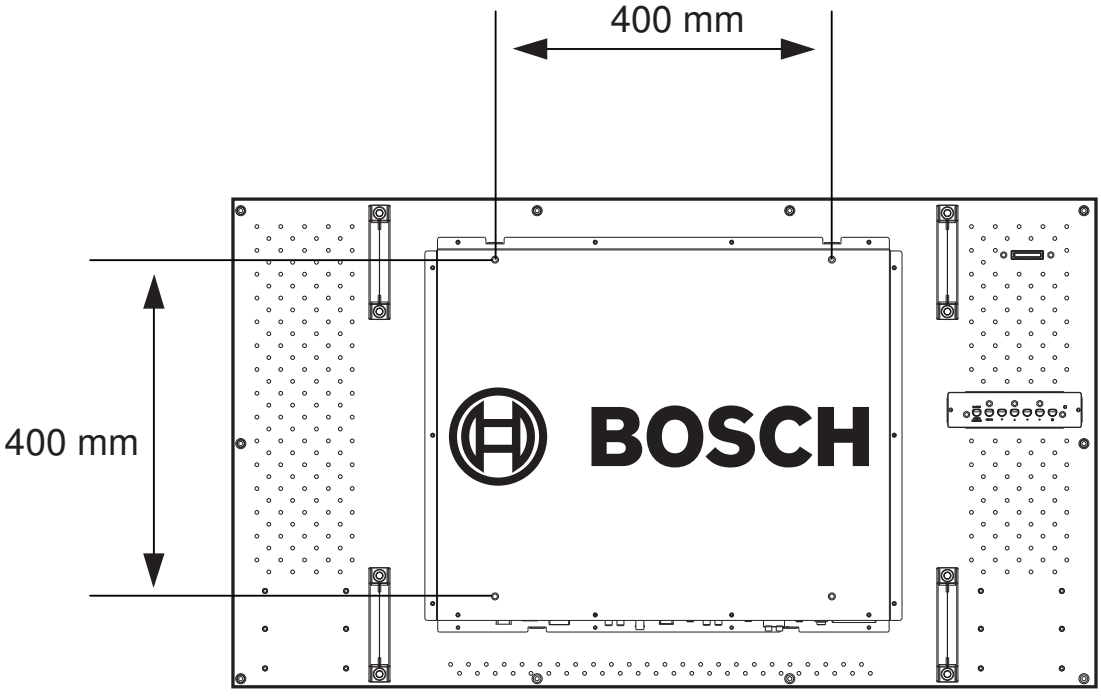


Figure 5.1: Wall mounting

5.2.2 Desktop Installation

Connect the two stands to the base of the monitor as follows:

1. Ensure that the power to the monitor and other attached devices are turned off.
2. Place the monitor with its front facing downward on a soft cloth.

3. Assemble the stands by inserting the stand shaft into the stand foot in the correct direction using the included screws in the accessory packet.
4. Attach each of the two stands to the base of the monitor using the included screws in the accessory packet – see following figure.
5. Once assembled, pick the monitor up carefully and position it upright on its stands (carefully checking that it is balanced and stable).

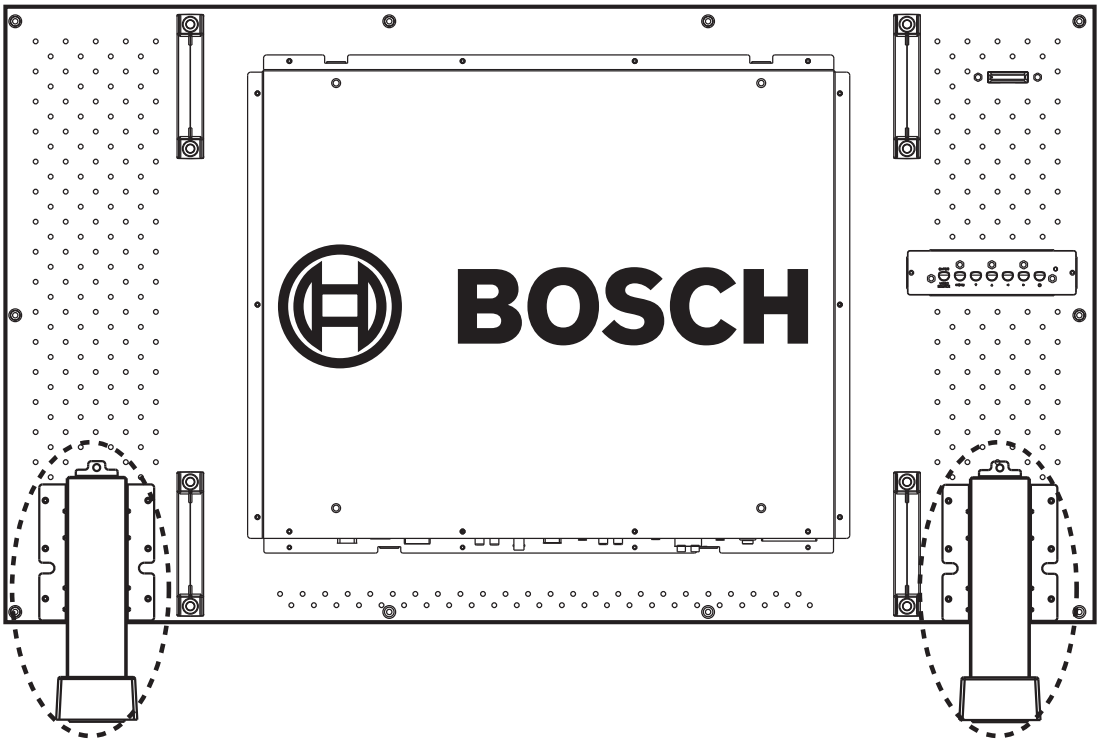


Figure 5.2: Mounting desktop stands

5.3 Connecting Power

The Bosch Flat Panel CCTV monitors are delivered with a 3-pole US-style power cord and a 3-pole Euro-style power cord. Use the US-style power cord where 120 VAC, 60 Hz power is available; use the Euro-style power cord where 230 VAC, 50 Hz power is available. The monitor automatically adjusts to either power input voltage.

5.4 Connecting the Composite Video Signal to the Monitor

There is one (1) BNC connector located on the rear panel of the monitor for composite video input and one (1) BNC connector for composite video output (Refer to *Connectors, page 14*).
Note: All video inputs are passive loop-through. The impedance is automatically set to 75 ohm by the input of the signal on the input connector, while operating in a single connection mode (refer to *, page 20*). If a cable is also connected to the output connector, the video signal can be passed on to another monitor connected to it via the passive loop-through function. Up to three (3) monitors may be connected in this manner (see also *, page 20*).
Note: To select AV1, press VIDEO SOURCE/ENTER, and then press the Up or Down arrow button, on the control panel (beside the MENU button).

5.5 Connecting the Y/C (S-Video) Signal to the Monitor

There is one (1) mini-DIN type connector for the S-Video (Y/C) input on the rear panel (see *Connectors, page 14*).

Note: Both Y and C inputs are terminated with 75 Ohm.

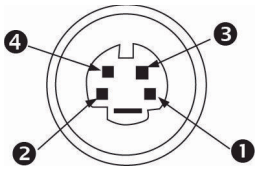


Figure 5.3: Y/C Connector pin-out

Number	Input
1	Ground
2	Ground
3	Y-signal
4	C-signal

5.6 Connecting Audio to the Monitor

There are two (2) sets of stereo audio connectors for audio inputs, located on the rear panel. These audio inputs are not associated with any input terminals on the rear panel, and can be freely connected to any audio input.

5.7 Connecting the PC Signal to the Monitor

There are several ways to connect the PC signal to the monitor: HDMI, DVI, VGA and DISPLAY PORT.

5.7.1 VGA Connection

Connect the PC signal using the VGA connector on the rear panel and a VGA cable (D-SUB to D-SUB).

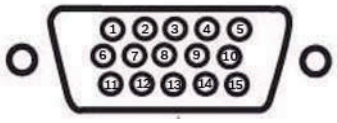


Figure 5.4: VGA Input

Pin	Description	Pin	Description	Pin	Description
1	Red Video	6	Red Ground	11	Ground
2	Green Video	7	Green Ground	12	SDA (for DDC)
3	Blue Video	8	Blue Ground	13	H-Sync or H+V Sync
4	Ground	9	N/A	14	V-Sync
5	Ground	10	Signal Cable Detect	15	SCL (for DDC)

5.7.2 HDMI Connection

Connect to the HDMI (High Definition Multimedia Input) using a HDMI cable (not supplied).

Figure 5.5: HDMI Input

5.7.3 DVI Connection

Connect to the digital DVI Input connector by using the supplied DVI-D cable.

Figure 5.6: DVI Input

5.7.4 DisplayPort

Connect the PC signal using the DisplayPort IN connector on the rear panel and a DP cable (DP to DP).

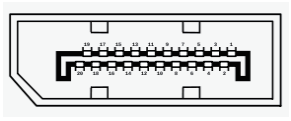


Figure 5.7: DisplayPort IN

5.8 Single / Multiple Monitor Configuration

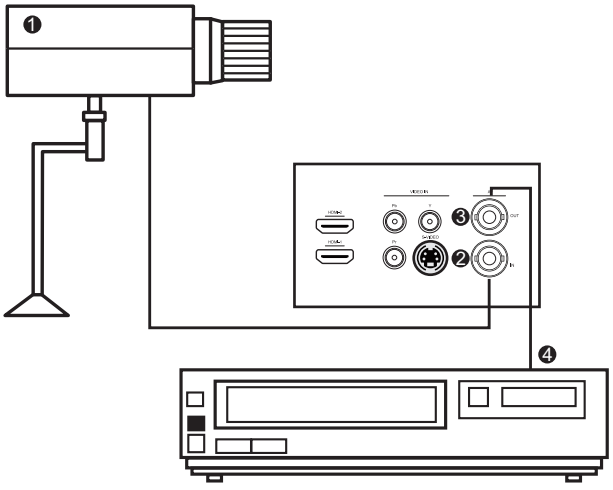


Figure 5.8: Single Monitor Configuration

Ref	Description	Ref	Description
1	Video Camera	3	Video Out
2	Video In	4	DVR

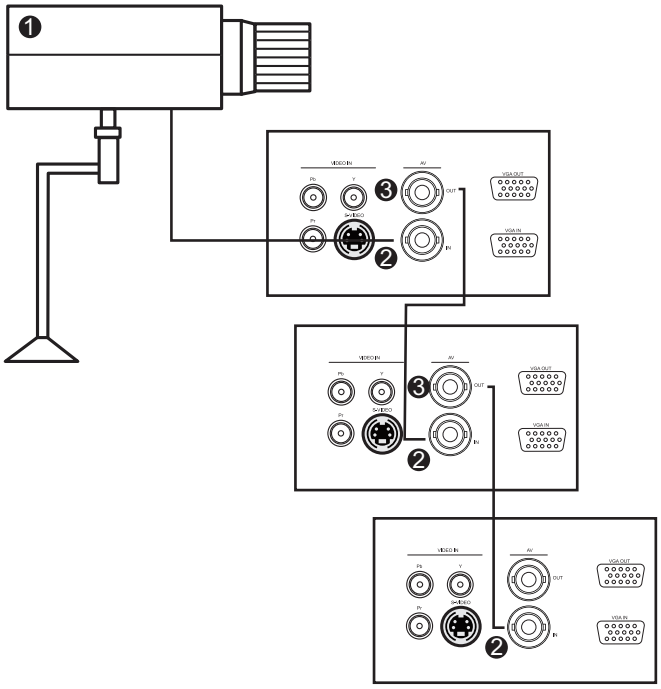


Figure 5.9: Multiple Monitor Configuration

Ref	Description
1	Video Camera
2	Video In
3	Video Out

See also

– *Single / Multiple Monitor Configuration, page 20*

5.9 Connecting to the network (LAN)

These connection steps require experience with working with the OSD – see *Navigating the Monitor, page 23*.

Connect to the LAN

1. Connect an RJ45 cable to the corresponding ports on the monitor, and to your LAN switch or router.
2. Enter the OSD menu **Setting** > **Control Setting**. Select **LAN**.
3. Enter the next OSD menu **Setting** > **Network Settings**.
4. If you are in a DHCP environment, select **DHCP** > **Execute** and press **ENTER**. Once done, the **IP Address**, **Subnet mask**, **Default gateway**, **Primary DNS**, and **Secondary DNS** settings will be displayed.
5. If you are not in a DHCP environment, select **Manual** > **Execute** and press **ENTER**. Contact your IT administrator for information on the **IP Address**, **Subnet mask**, **Default gateway**, **Primary DNS**, and **Secondary DNS** settings and enter them accordingly.
6. To save the settings and return to the previous menu, select **Execute** then press **ENTER**.

Controlling the display

Once you have the correct IP address for your display and the display is on or in standby mode, you can use any computer that is on the same local area network to control the display.

1. Enter the IP address of the display in the address bar of your browser and press **Enter**.

2. The setting page appears:
   - **Information**: Shows information of the display. It is for information only. There are no items that can be set.
   - **Picture & Sound**: Provides options for picture and sound adjustments.
   - **Screen**: Provides options related to display adjustments.
   - **Setting**: Provides options for advanced display adjustments.
   - **Mail Report**: Provides options for setting up email accounts to receive status or error reports sent from the display.
   - **Network**: Provides options for:
     - manually setting the monitor IP address
     - obtaining an IP address from a DHCP server
     - setting/changing the user name and password to secure this network control system

Notes:

You cannot control the display via the RS-232C connector when LAN control is in use.

It is recommended that you use Internet Explorer versions 7.0 or higher.

If you need to turn on the display from a web page, make sure:

- the **Setting** > **Control Setting** menu is set to **LAN**
- the **Setting** > **Power save** menu is set to **LOW** or **Of**

6 Navigating the Monitor

6.1 Navigating the Control Panel

Use the control panel to make any necessary OSD adjustments. See the figure below for an explanation of the control panel.

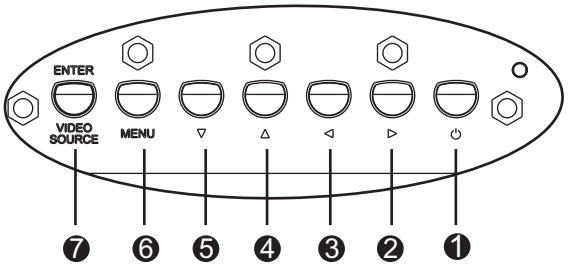


Figure 6.1: Control Panel Buttons

Ref.	Button	Description	
1	Power	Display Power (On/Off)	
2	▶	Increases the value when in the OSD. Increases audio volume.	Scrolls right in the OSD.
3	◀	Decreases the value when in the OSD. Decreases audio volume.	Scrolls left in the OSD.
4	▲	Adjusts the value when in the OSD.	Scrolls up in the OSD.
5	▼	Adjusts the value when in the OSD. Auto adjusts when in PC mode.	Scrolls down in the OSD.
6	Menu	Selects the on-screen display (OSD).	
7	VIDEO SOURCE/ENTER	Selects the signal to be displayed Serves as the “Enter” function for OSD menus	

Notice!

This monitor has a special **key lock** function for both the control panel and remote control to prevent unintentional operator actions.

Lock/unlock the buttons on the control panel by simultaneously pressing and holding the **left** and **right** arrow buttons on the control panel for 5 seconds.

Lock/unlock the buttons on the remote control by simultaneously pressing and holding the **MENU** and **left** arrow buttons on the control panel for 5 seconds.

Lock/unlock the buttons on both the remote control and control panel by pressing the **down** arrow button on the remote control for 5 seconds, and then the **ENTER** button.

6.2 Using the Monitor On-screen Display (OSD)

The LCD is programmed through the on-screen display (OSD) menus and submenus where an operator can select operating parameters. To access the OSD menus, press the **MENU** button on the control panel or on the remote control. Use the buttons on the panel or remote to make any necessary adjustments to the OSD.

Notice!

When you are navigating through the OSD menus, use the **VIDEO SOURCE/ENTER** button to select a menu and use the **MENU** button to exit a menu.

To set up the signal connection, follow the steps below:

1. Connect the appropriate Video, S-Video, DVI, HDMI, VGA or DisplayPort signal cable to the monitor.
2. Press the Power button to turn on the unit.
3. Press the **VIDEO SOURCE/ENTER** button on the control panel (or **INPUT** on the remote control) and then the **up** and **down** arrow buttons until the correct signal is displayed. Confirm your selection by pressing the **VIDEO SOURCE/ENTER** button (or the **ENTER** button on the remote control).

(You can also directly choose the desired signal button on the remote control.)

To navigate within the OSD menus, follow the steps below:

1. Press the **MENU** button to activate the main menu selections.
2. Press the **up** and **down** arrow buttons to select a menu.
3. Press the **right** arrow button to enter the selected menu.
4. Press the **up** and **down** arrow buttons to select a sub-menu item.
5. Press the **left** and **right** arrow buttons to toggle the OSD values.
6. Press the **MENU** button to confirm a selection, or to exit the selected menu and to return to the menu bar.
7. Press the **MENU** button again to exit the OSD menu bar.

6.3 On-screen Display Menus

There are four (4) on-screen menus that allow you to customize your monitor settings. Press the **MENU** button (on Control panel or remote) to access the OSD menu.

Icon	Menu	Function
	Picture	Adjust relevant picture quality settings. See *Picture Menu, page 25*.
	Sound	Adjust relevant sound settings. See *Sound Menu, page 27*.
	Screen	Adjust relevant screen display settings. See *Screen Menu, page 28*.
	Settings	Resets the factory default settings and adjust the overall monitor settings. See *Setting Menu, page 31*
Note: Some of the OSD menu functions may not be available depending on the input source detected.		

6.4 Picture Menu

Access the Picture menu using the **MENU** button on control panel or remote control.

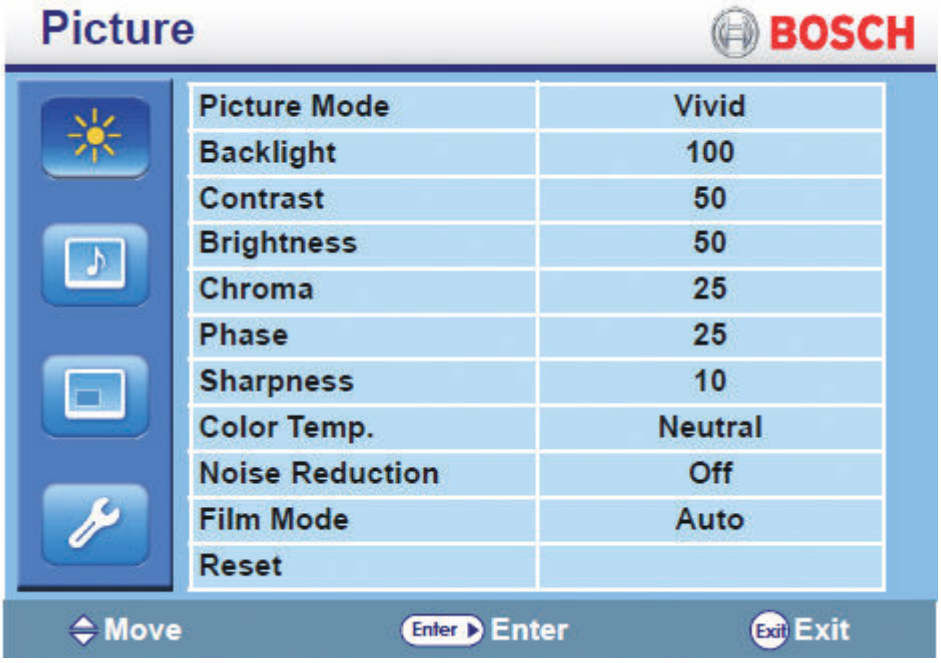


Figure 6.2: Picture menu

Submenu	Definition
Picture Mode	Selects the automatic picture control mode. Choices are: **Standard**: applies factory default values. **Vivid**: for viewing very bright images. **Cinema**: for viewing movies. **Custom**: creates your own picture settings. This mode is automatically selected after you change the settings in the Picture menu.
Backlight	Adjusts LCD backlight intensity of the screen (range 0-100). **Note**: This feature is not available if the **Ambient Light Sensor** or **Adaptive Contrast** function is set to **On** (see **Advanced** option in *Setting Menu, page 31*).
Contrast	Adjusts the contrast level for video performance (range 0-100).
Brightness	Adjusts the brightness level for video performance (range 0-100).
Chroma	Adjusts the overall color intensity of the screen (range 0-100).
Phase	Adjusts the phase of the picture (range 0-100).
Sharpness	Adjusts the sharpness level for video performance (range 0-100).
Color Temp	Selects the color temperature. Choices are: **11000 K** **9300 K** **6500 K** **Custom** (options here are: **Red, Green, and Blue**)
Noise reduction	Reduces electrical image noise caused by different media players.
Film mode	Optimizes the screen display automatically by detecting picture content and applying a reverse 3-2 or 2-2 pull-down process. The picture will be clearer and more natural. **Note**: This function is not available when displaying Picture and Picture (PAP). This function may not work correctly, depending on the input signal.
Reset	Resets all settings in the Picture menu.

See also

– *Screen Menu, page 28*

6.5 Sound Menu

Access the Sound menu using the **MENU** button on control panel or remote control.

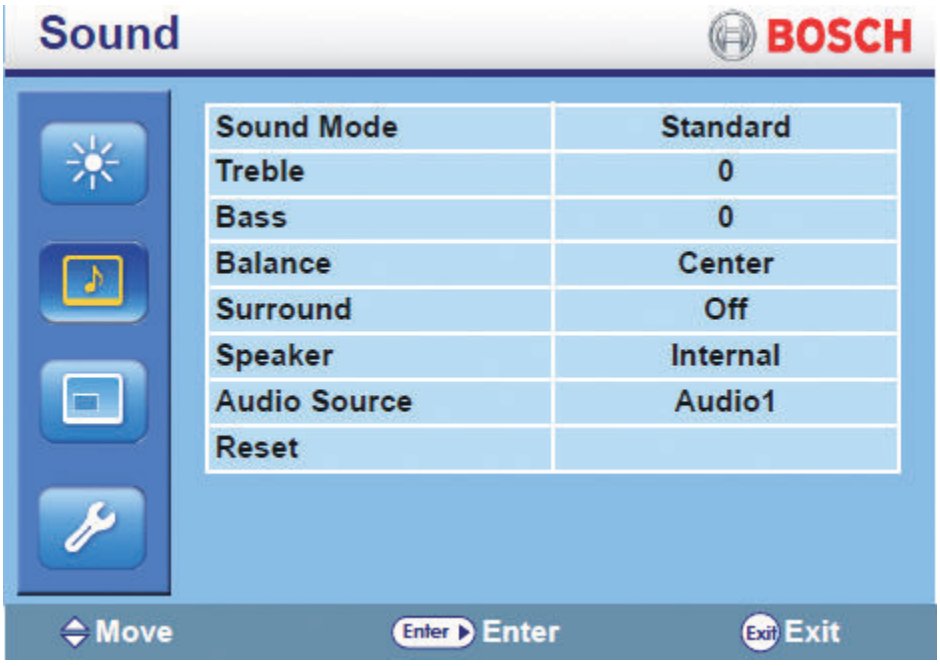


Figure 6.3: Sound menu

Submenu	Definition
Sound mode	Adjusts the sound output from the speakers: **Dynamic**: Enhances treble and bass **Standard**: Flat settings **Custom**: Recalls the customized settings
Treble	Adjusts treble
Bass	Adjusts bass
Balance	Adjusts balance
Surround	Turns the surround mode on or off
Speaker	Sets the audio output source: **Line-Out**: Selects the audio output source from **AUDIO OUT (R/L)** on connector panel **External**: Selects the audio output source from **SPEAKERS (R/L)** on connector panel **Internal**: Select the audio output source from the internal speakers
Audio Source	Selects the audio input source: **Audio1** connector **Audio2** connector **HDMI1** connector **HDMI2** connector **DisplayPort** connector
Reset	Resets all settings in the **Sound** menu

6.6 Screen Menu

Access the Screen menu using the **MENU** button on control panel or remote control.

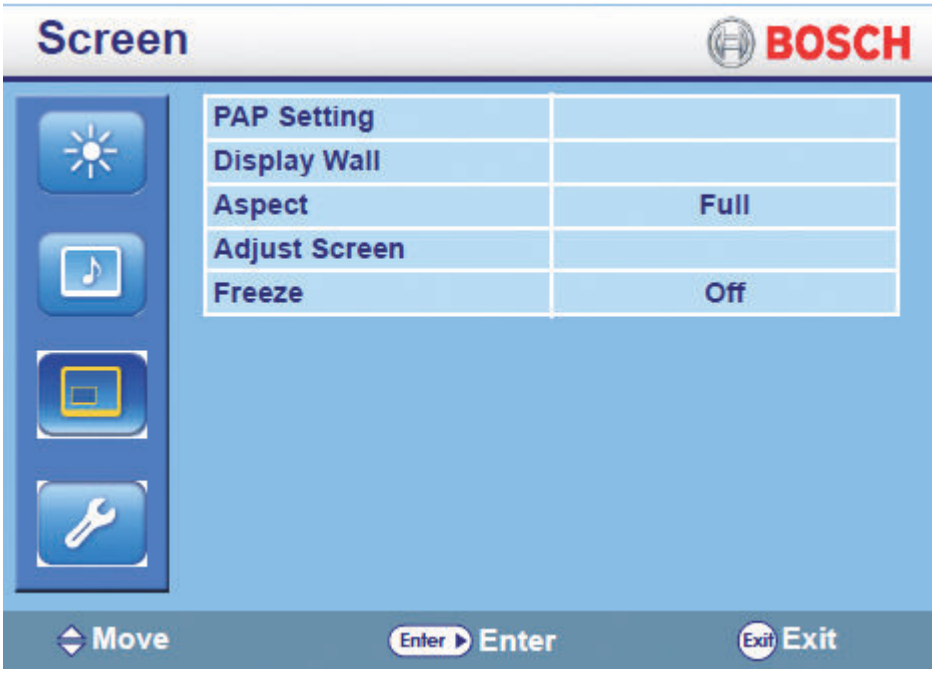
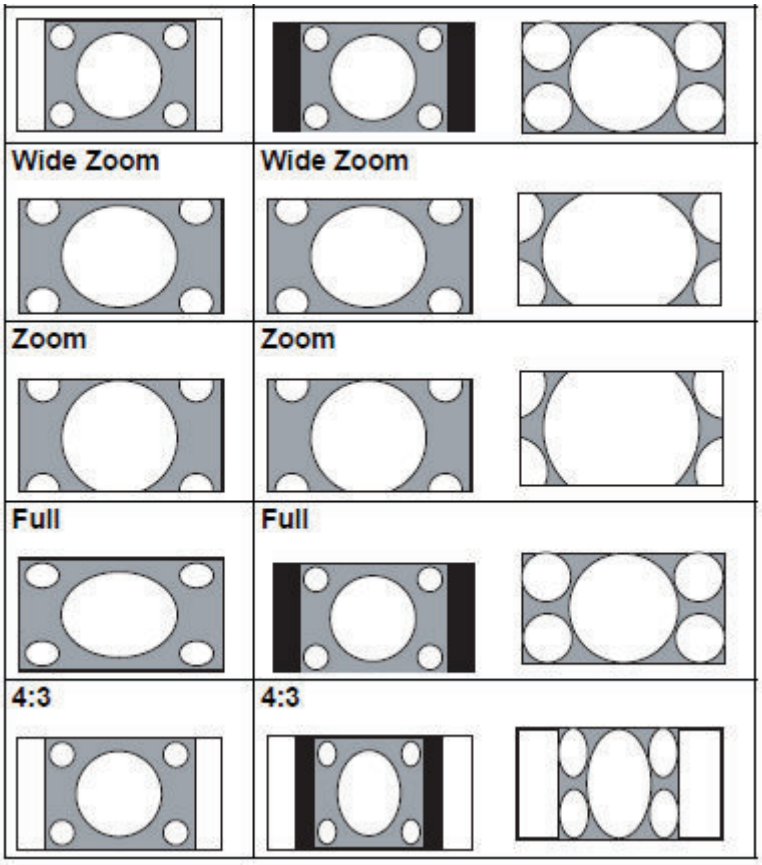
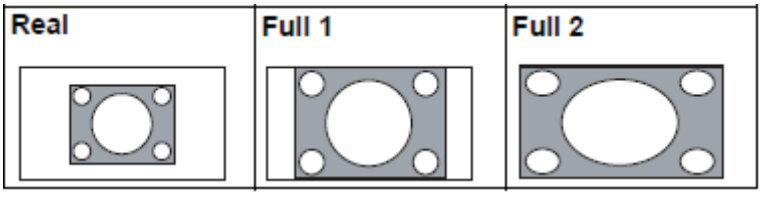


Figure 6.4: Screen menu

Submenu	Definition
PAP Setting (Picture and Picture)	Turns on or off the PIP (Picture in Picture) and PBP (Picture by Picture) functions: **Active Picture**: For PIP, selects the main or sub picture to operate. For PBP, selects the left or right picture to operate. Swaps the main/sub or left/right pictures. **Picture Size**: Changes the size of the sub picture. **Picture Position**: (PIP only) Changes the position of the sub picture. **Note**: PAP is not available for all signal source combinations. See *PAP Availability, page 30* for more information on supported combinations. In PAP mode, only sound from the active picture will be available.
Display wall	**H. Monitors/V. Monitors**: Sets the number of displays used in the horizontal/vertical direction. **H. Position/V. Position**: Sets the horizontal/vertical position of the display wall matrix. **Frame Comp.**: Adjusts images near the display edges for optimal demonstration across the display wall. **LED**: Turns the power indicator on the display on or off. **Power On Delay**: Choose to enable or disable a sequence in turning on the screen matrix. If enabled, the display will turn on with a maximum 10 second delay

Aspect	Sets the picture's aspect ratio: **Wide Zoom**: Enlarges to fill screen with minimum distortion. **Zoom**: Enlarges the picture, keeping the same aspect ratio. **Full**: Enlarges the picture horizontally to fill the screen when the picture source is 4:3 (Standard definition). When the picture source is 16:9 (High definition), it displays in the same 16:9 aspect ratio. **4:3**: Displays all picture sources in 4:3 aspect ratio. **Full 1**: Enlarges the picture to fill the screen in the vertical direction, keeping the same aspect ratio. A black frame may appear around the picture. **Full 2**: Enlarges the picture to fill the screen. **Real**: Displays the picture in its original number of dots. For video signal inputs:  For PC signal input: 

Adjust screen	**Auto Adjustment**: Auto synchronizes screen to graphics adaptor. **Phase**: Adjusts the monitor's phase. **Clock Frequency**: Adjust the monitor's clock frequency. **H. Position**: Adjust the monitor's horizontal position. **V. Position**: Adjust the monitor's vertical position.
Freeze	Select **On** to freeze the displayed image.

6.6.1 PAP Availability

The table below summarizes the availability of the input source combinations for the PIP feature. ("+" indicates accepted combination, a blank cell indicates the combination is **not** valid).

		Main Picture Input Source						
		AV	S-Video	YPbPr	VGA	DVI	HDMI	DisplayPort
Sub Picture	AV				+	+	+	+
	S-Video				+	+	+	+
	YPbPr					+	+	+
	VGA	+	+			+	+	+
	DVI	+	+	+	+			+
	HDMI	+	+	+	+			+
	DisplayPort	+	+	+	+	+	+	

6.7 Setting Menu

Use the arrow buttons to make changes and the **MENU** button to exit submenu.

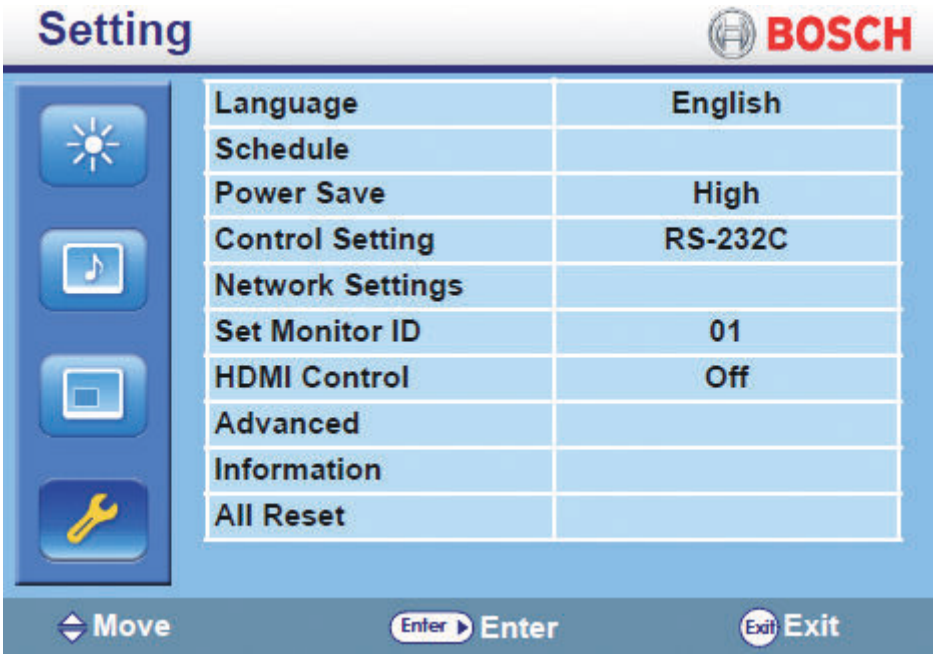


Figure 6.5: Setting menu

Submenu	Definition
Language	Select a language for the OSD.
Schedule	**Date and Time**: Sets up current date and time for the monitor's internal clock before using the **Schedule** function. **Clock Display**: Sets whether to show the current time which was set. **Input**: Sets an input source to display when the display is automatically turned on next time. **On/Off Timer**: Sets when to turn on or off the display. Note: Set the current time before setting the On/Off Timer. When scheduling settings overlap, the Everyday setting takes priority over other weekly settings.

Power Save	Sets the display to enter the power saving mode when there is no signal detected (see also *Power Management, page 34*). **Low**: All signal sources can enter the power saving mode and wake up the display. **High**: All signal sources can enter the power saving mode, but only a VGA signal can wake up the display, or you must press the power button to wake up the display when other source is connected. **Off**: If no signal source is detected, the backlight will stay on. **Note**: Serial can bring any mode out of the power saving status. LAN can bring **Low** mode out of the power saving status.
Control Setting	**RS-232C**/**LAN**: Choose a terminal to control the display. **IR Pass through**: Select if multiple displays are connected via RS-232C cables: – **Primary**: Designate the display as the primary unit for remote control operation. Only this display will be operated by the remote control. – **Secondary**: Designate the display as the secondary unit. The display can not be operated by the remote control, and will only receive the control signal from the primary display via the RS-232 connection. Note: To reset to the default setting (**RS-232C**), press **INFO** on the remote control for 5 seconds
Network Settings	See *Connecting to the network (LAN), page 21*.
Set Monitor ID	Sets the ID number for controlling the monitor when multiple monitors are connected under the **RS-232C** control mode. Each monitor must have a unique ID number (this will define its position within the matrix). For example: starting on the top row (working left to right), the top left monitor can have an ID of 1; when you reach the end of the row, the next number will refer to the monitor one row down, starting at the left.
HDMI Control	Uses the HDMI CEC (Consumer Electronics Control) industry standard protocol to share functionality between connected devices and the monitor. This means you can send system commands to the monitor and a connected device using one remote control as follows – Connect an HDMI cable between the monitor and a device equipped with HDMI CEC. – Make sure **On** is selected for this menu option **HDMI Control**.

Advanced	**Auto Detection**: Automatically detects available input sources. **Auto Adjustment**: Automatically optimizes image display for the VGA input. **Overscan**: Turns the overscan function on or off. **RGB Signal**: Sets the type of signal for a piece of video equipment or PC connected to the HDMI of the display **Image Retention**: Automatically displays swift moving patterns to prevent image retention on the screen. **OSD Rotation**: Adjusts the OSD rotation (see product specifications for models recommended for portrait orientation. Landscape only models operated in portrait mode may result in premature failure and will not be covered under the warranty). **OSD Info Box**: When turned On, switching signal inputs or changing timing will show the current input source and resolution on screen. Select Off to show the information box on screen only when you press **INFO** on the remote control. **Adaptive Contrast**: Turns the Adaptive Contrast function on or off. This feature enhances image contrast for dark scenes. (This feature is not available if the Ambient Light Sensor function is set to On – see below). **Ambient Light Sensor**: When turned On, the image brightness will adjust automatically as the ambient lighting conditions change. **IR Out**: Operate multiple monitors with one IR remote control as follows: – Select **IR-Out > On**. – Point the remote control to the first display with its IR OUT port connected to the second display's IR IN port (the second display's IR OUT port connects to the third display's IR IN port, and so on).
Information	Displays the following monitor information: – Date – Model Name – Serial Number – Operating Time – Software Version – LAN Version – IP Address
All Reset	Returns all settings to factory default values

7 Power Management

This monitor has a power management system to “power down” upon receipt of the display power management signaling (DPMS) from a DPMS video card.
The DPMS-compliant video card performs this signaling by not sending a horizontal, vertical, or a sync signal. The monitor enters an appropriate mode through identifying each of the three (3) modes of the signaling system.
The LED indicator on the back of the monitor signals the current power mode status – see *Rear panel exploded view, page 13*.

8 Troubleshooting

Problem	Solution
No image displayed on screen	– Check that the power cord of the monitor is securely connected into the wall outlet or grounded extension cable or strip. – Power switch should be in the ON position and the LED lit. – Check that the Brightness and/or Contrast adjustments of the display have not been turned down to minimum levels.
Display image is not centered, or is too small or too large in the PC mode	Push the down arrow button to activate the Auto Adjustment function. - or - Adjust the Frequency and Phase in the OSD submenu – see *Screen Menu, page 28*.
Vertical or horizontal noise is present in the picture	Push the down arrow button to activate the Auto Adjust function. - or - Adjust the Frequency and Phase in the OSD submenu.
Incorrect colors	Select a color temperature in the Color Temp menu. - or - Use the Reset function to reset to the default settings.
The error message “Out of Range” is displayed	PC is operating with either a resolution or timing mode that is not supported by the monitor. Change the PC timing mode to one of the valid combinations below: – 640 x 480 (60/72/75Hz) – 720 x 400 (70Hz) – 800 x 600 (60/75Hz) – 1024 x 768 (60/75Hz) – 1280 x 768 (60Hz) – 1280 x 960 (60Hz) – 1280 x 1024 (60Hz) – 1366 x 768 (60Hz) – 1600 x 1200 (60Hz) – 1920 x 1080 (60Hz)

9 Maintenance

To clean the LCD panel, wipe off water droplets or oil immediately with absorbent cotton or a soft lint-free cloth. Staining and discoloration may occur if left on the panel for long periods. If the surface (polarizer) of the LCD panel is dirty or stained, use absorbent cotton or a soft lint-free cloth to remove the residue as follows:

1. Turn off the monitor and disconnect it from the power supply.
2. Do not spray any liquid directly on the screen. Dampen a clean, soft, lint-free cloth with water only (a paper towel or dirty cloth can scratch the screen).
3. Gently wipe the screen starting from top to bottom, wiping in a downward motion. Do not damage the screen by pressing too hard.
4. To avoid streaking, wipe the screen again with another clean, dry, lint-free cloth.

Notice!

If water does not work, use a mild cleaner labeled for use with LCD panels, available at office supply stores.

Do not use any of the following as a cleaning agent (they may permanently damage the polarizer due to a chemical reaction):

- Ketone type materials
- Ethyl alcohol
- Ethyl acid
- Toluene
- Methyl chloride
- Ammonia

10 Technical data

Electrical

Rated Voltage	120/230 VAC, 50/60 Hz
Voltage Range	100–240 VAC, 50/60 Hz
Frequency	Horizontal: 60–73 KHz Vertical: 47–63 Hz
Power at Rated Voltage	On = 149 W Active Off = 0.5 W

Video

Sync Format	PAL/NTSC automatic detection
LCD Panel	LED backlight
Viewable Picture Area	46 in.
Active Display Area (H x V)	1018.08 x 572.67 mm (40.08 x 22.55 in.)
Pixel Pitch (H x V):	0.53025 x 0.53025 mm (0.02088 x 0.02088 in.)
Resolution[1]	1920 x 1080
Aspect Ratio	16:9
Display Colors	1073.7 million
Response Time	6.5 ms (typical)
Backlight	50,000 hours
1. Pixel Policy: Bosch monitors follow the ISO 13406-2 Class II standard.	

LCD Panel Optical Characteristics

Luminance	450 cd/m^2 (typical)
Contrast Ratio	3500:1 (typical)
Viewing Angle	Horizontal/Vertical: 178° (typical)

Video Input	
Composite Video (CVBS)	1.0 Vp-p (0.5–1.5 Vp-p), automatic switching from 75 Ohm unbalanced termination to Hi-Z with passive loop-through operation
Y/C (S-video)	0.7 Vp-p (Y-signal), 0.3 Vp-p (C-signal), 75 Ohm termination
Component	Y, Pb, Pr
Digital Inputs	DVI D (1 x) and HDMI (2 x)

VGA (RGB PC)	0.7 Vp-p (0.5–1 Vrms)
Audio Input	2.0 V line level, mono

RGB and DVI	**HDMI**
640 x 480 (60/72/75 Hz)	640 x 480 (60/72/75 Hz)
720 x 400 (70 Hz)	720 x 400 (70 Hz)
800 x 600 (60/75 Hz)	800 x 600 (60/75 Hz)
1024 x 768 (60/75 Hz)	1024 x 768 (60/75 Hz)
1280 x 768 (60 Hz)	1280 x 768 (60 Hz)
1280 x 960 (60 Hz)	1280 x 960 (60 Hz)
1280 x 1024 (60 Hz)	1280 x 1024 (60 Hz)
1360 x 768 (60 Hz)	1360 x 768 (60 Hz)
1366 x 768 (60 Hz)	1366 x 768 (60 Hz)
1400 x 1050 (60 Hz)	1400 x 1050 (60 Hz)
1600 x 1200 (60 Hz)	1600 x 1200 (60 Hz)
1680 x 1050 (60 Hz)	1680 x 1050 (60 Hz)
1920 x 1080 (60 Hz)	1920 x 1080 (60 Hz)
	480i (60 Hz)
	480p (60 Hz)
	576i (50 Hz)
	576p (50 Hz)
	720p (25/3050/60 Hz)
	1080i (50/60 Hz)
	1080p (24/25/30/50/60 Hz)
	1080p (24/25 Psf)

Controls

Input	
Rear Control Panel	Push-buttons
Remote control	Push-buttons
Video Source	Selects: Component Video, S-video, VGA, HDMI, DVI-D
Menu	Selects on-screen display (OSD), up cursor, down cursor/auto adjust, left cursor, right cursor

Power	On/Off
Control Panel Lockout	Multiple push-button combination

On-screen Display	
Video Mode	Input Source, Screen, OSD, Utility

Indicators (on rear)	
LED	Power On (green) Power Off, Standby (red)

Connectors	
Video 1 (AV1)	Composite video: two (2) BNC (1 in, 1 out)
Digital	Two (2) (1 DVI-D in, 1 DVI-D out)
IR	Two (2) (1 in, 1 out)
Display port	One (1) in
HDMI	Two (2) in
VGA	One (1): 1 RGB 15-pin D-sub in, 1 RGB 15-pin D-sub out
Component	One (1): Y, Pb, Pr
Y/C (S-video)	One (1) mini-DIN, 4-pin (1 in)
Audio	1 Audio In: RCA (right/left) 1 Audio In: phono jack 1 Audio Out: RCA (right/left) 1 Speaker Out (right/left)
RS-232	Two (2) (1 in for firmware update, 1 out for firmware update)
Power Input	100 – 240 VAC
Power Output	100 – 240 VAC

Mechanical

Cabinet Material	SECC
Finish	Black
Mount	Wall mounting compatible with standard bracket (optional) Desk mount (optional)
VESA Mounting Compliance	400 x 400 mm (15.7 x 15.7 in.)
Dimensions (W x H x D)	
Monitor	1023.68 x 578.27 x 111.8 mm (40.30 x 22.77 x 4.4 in.)

With Packaging	1190 x 754 x 290 mm (46.85 x 30.08 x 11.42 in.)
Weight	
Monitor Weight	25 kg (55.12 lb)
Shipping Weight	30 kg (66.14 lb)

Environmental

Operating Temperature	0°C to +50°C (32°F to 122°F)
Storage Temperature	0°C to +50°C (32°F to 122°F)
Humidity	0% to 90% Relative

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